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HOME CANNING OF FRUITS AND VEGETABLES IN TIN CANS

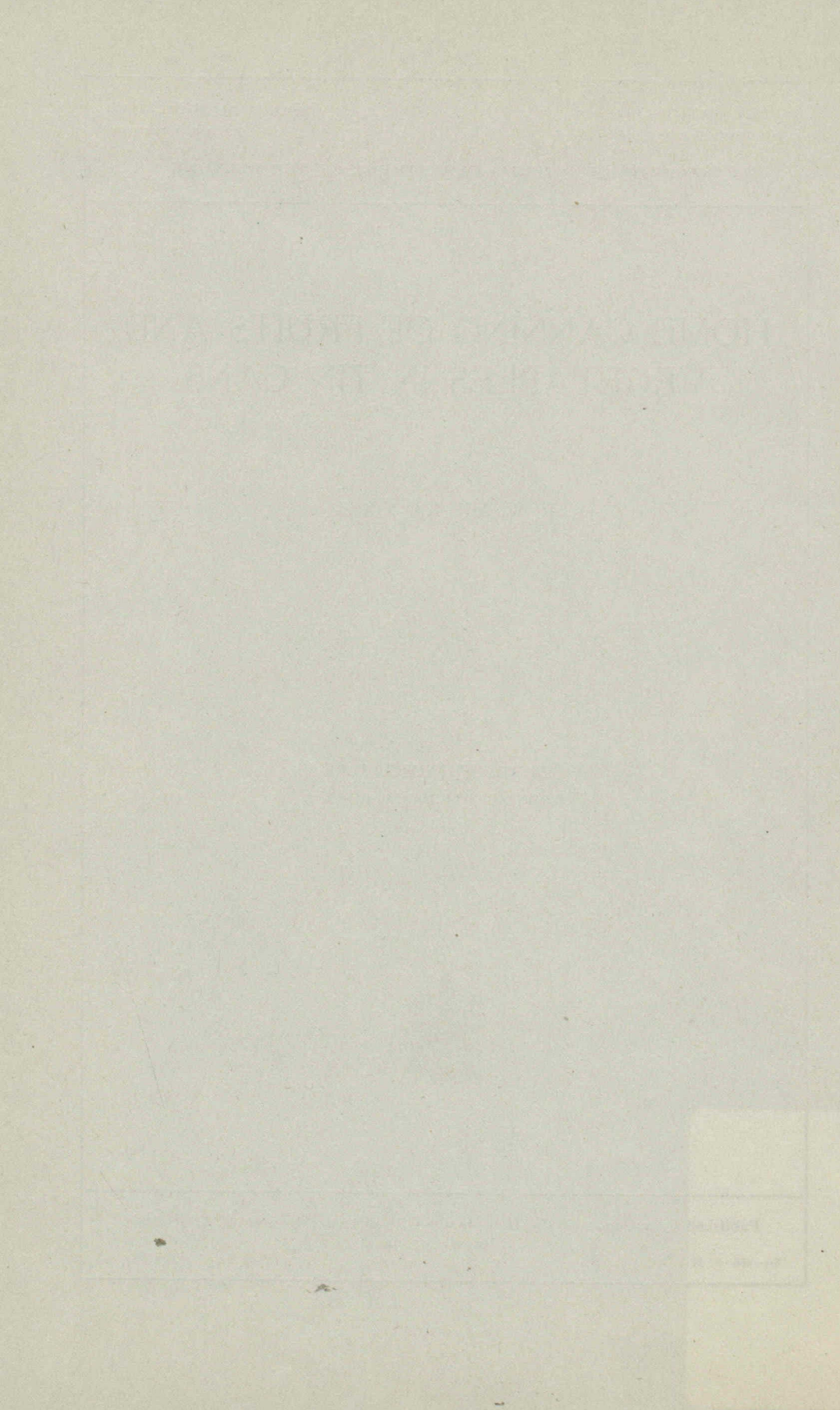
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DIVISION OF HORTICULTURE
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by authority of the Hon. JAMES G. GARDINER, Minister of Agriculture
Ottawa, Canada



CANNING FRUITS AND VEGETABLES IN TIN CANS

THE use of tin cans for home canning offers certain advantages over glass containers. In the first place there is no danger of breakage, secondly, the processed cans may be plunged in cold water immediately after sterilizing thus shortening the cook and improving the product, and thirdly, the opening of the "sanitary" type (rim seal) of can is the full width of the can which makes packing easier.

The cover of the sanitary can is crimped on to the body of the can by the double seaming action of the can sealing machines. Various types of these machines are in use. (Figs. 1 and 2). It is important that the seal be perfectly made or spoilage will result, but since the machines are adjustable it is quite a simple matter to keep them operating efficiently. The following test should be made occasionally to test the seal:—

Place a little water in an empty can and seal it. Then, using a pair of tongs, immerse the can in very hot water, keeping the makers end down and holding immersed for several minutes. If no bubbles are seen coming from the can, the seal is perfect.

Cans may be purchased in various sizes and are known by numbers. Nos. 1, 2, 2½, 3 and 10 are the sizes most usually used but the No. 10 (gallon can) is not recommended for home use as, being so much bigger than the others, it requires a special sealing machine. For general purposes the No. 2 can is used, with the 2½ and 3 size being used by large families or for such products as tomatoes, of which large quantities are used.

If, when the cans are opened, they are found to be in good condition they may be reflanged and used a second time. This is only possible where the sealing machine used has reflanging equipment. If cans are to be reflanged they should be emptied as soon as opened, washed in boiling water and stored in a dry place.

All sizes of sanitary cans are made in three types—Plain tin, R. enamelled and C. enamelled.

The Plain tin cans may be used for any product, but in the case of certain fruits and vegetables better colour is preserved by using enamel lined cans.

R. Enamelled cans are used for the red coloured fruits and vegetables, which fade when canned in plain cans.

C. Enamelled cans are used for high protein foods which, when canned in plain cans, darken due to the formation of sulphides. Corn, hominy, succotash, Lima beans and peas are examples of high protein vegetables. C. Enamelled cans must not be used for any acid fruits or vegetables.

SPOILAGE OF CANNED GOODS

Canned fruits, if improperly sterilized or sealed, may become moulded or fermented. Both these forms of spoilage are easily recognized and do not render the material injurious to health. They do, however, impart a flavour that is not pleasing, and fermentation, being accompanied by the formation of gas may result in the cans bursting.

In canned vegetables spoilage may result in the products becoming extremely poisonous. Gas may or may not be formed and for this reason the contents of every can of vegetables should be examined before being used.

Spoiled vegetables develop a sour or rancid odour and the liquid is generally cloudy, the general appearance, however, may not be affected.

It is a wise precaution to boil canned vegetables for a few minutes after they are removed from the can. This does not imply that they must be eaten hot. When the vegetables are required for salads they may be set aside after boiling and chilled before use.

If the directions given are followed exactly no spoilage should occur. In nearly every case, spoiled canned goods are the direct result of carelessness.

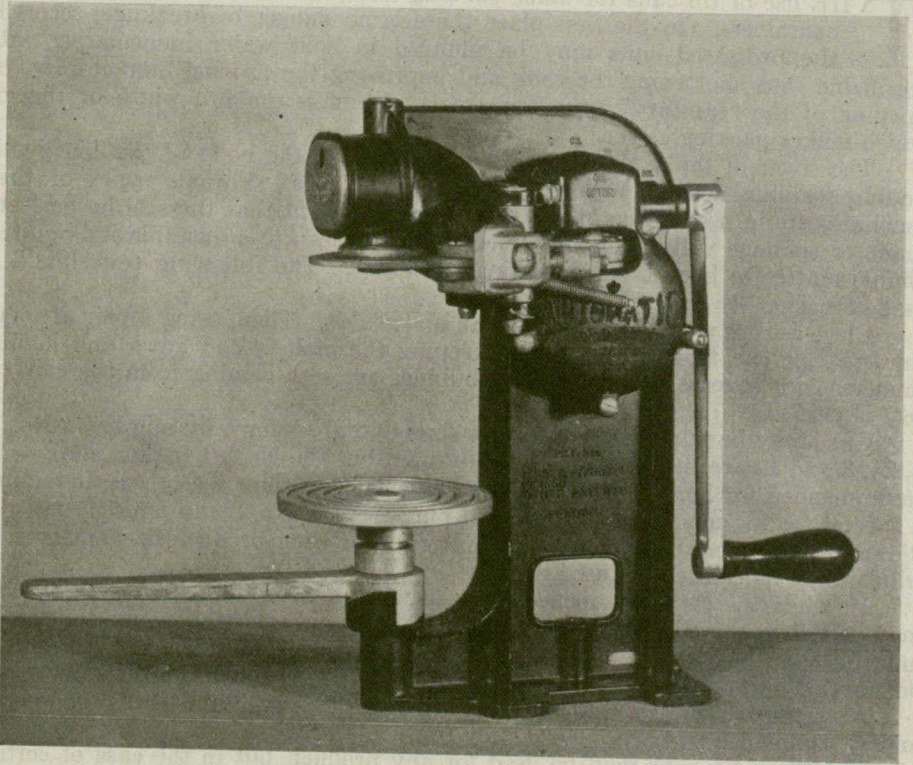


FIGURE 1.—Automatic Can Sealer.

FOLLOW THESE RULES

1. Use only fresh fruits and vegetables.
2. Make sure the machine is sealing perfectly.
3. Follow the instructions given for each fruit and vegetable *exactly*.

CANNING FRUITS IN TIN CANS

For canning fruits the following steps are necessary:—

1. Preparation of fruit.
2. Packing in the cans.
3. Syruping.
4. Exhausting.
5. Sealing.
6. Processing.
7. Cooling.

1. Preparation of the fruit consists of grading, hulling, trimming, washing and such other treatment as is necessary. Only fresh, ripe, well coloured and full flavoured fruits should be used to obtain the best results.

2. The cans should be well filled but the fruit should not be forced into the cans. In the case of soft fruits, tapping the cans on the table while filling will ensure a good fill.

3. The cans should be filled up with syrup to within about $\frac{1}{8}$ inch from the top. Over-filling will cause bulging and under-filling may cause buckling especially in the larger cans. *Syrup must be used boiling hot.*

Light syrup..	1 cup sugar to 3 cups water
Medium syrup..	1 cup sugar to 2 cups water
Heavy syrup..	1 cup sugar to 1 cup water

4. The Exhausting process consists of heating the contents of the can to about 180°F. and is for the purpose of driving out air from the fruit. This prevents the acid in the fruit attacking the metal of the can and also helps in preserving the vitamins in the fruit. A dish pan or wash boiler may be used for exhausting. Set the filled cans in water which is nearly boiling, having enough water to come up to within 1 inch from the top of the can. Keep the pan on the stove while exhausting to keep the water hot.

5. The cans should be sealed immediately following exhausting, taking the cans from the water one by one and sealing each one immediately.

6. *Processing* is the term given to the sterilizing or cooking process. All acid fruits are readily sterilized in boiling water. Using a wash boiler or other suitable container, immerse the cans completely, and measure the process time from the time when the water comes to a full boil. The cans should not be allowed to cool off too much before processing. For this reason each batch should be processed immediately after exhausting and sealing.

7. As soon as the processing time has elapsed the cans should be placed in cold water and left until cooled. In running water this will take about 20 minutes. Following cooling they should be dried off and stored in a cool dry place.

APPLES—Use Plain Cans

"Solid Pack" apples are most satisfactory. Pare, core and quarter the apples, holding the quarters in weak brine (2 tablespoons salt per gallon of water). Before packing, blanch the quarters by placing them in a cheesecloth bag and immersing in boiling water for two or three minutes. Cover with boiling water instead of syrup. Exhaust No. 2 cans 4 minutes and process 15 minutes, exhaust No. 2½ cans 5 minutes and process 18 minutes.

APPLE SAUCE—Use Plain Cans

Prepare the apple sauce as for table use. Fill into cans boiling hot and seal immediately. No exhaust is necessary, the cans being filled hot. Process No. 1 cans 5 minutes, No. 2 and No. 2½ cans 15 minutes.

APRICOTS—Use Plain Cans

Peel the fruit, if desired, by hand or by dipping in boiling water for one minute, or until the skin will slip off, and plunging immediately into cold water. Slip off the skin by hand, halve the fruit and remove pits. Use light or medium syrup boiling hot. Exhaust No. 2 and No. 2½ cans 4 minutes. Process No. 2 cans 10 minutes and No. 2½ cans 15 minutes.

BERRIES—Use R. Enamelled Cans

Raspberries, strawberries, blackberries, loganberries and blueberries are all canned by the same method. Prepare the fruit carefully by hulling, sorting and washing as necessary. Pack the fruit into cans and use heavy syrup for best flavour. Medium syrup may be used however. Exhaust all sizes 10 minutes. Process No. 1 cans 10 minutes, No. 2 and $2\frac{1}{2}$ cans 15 minutes.

CHERRIES—Use R. Enamelled Cans

Wash and pit the cherries, and save the juice that runs out when pitting to use when making the syrup. Use heavy syrup for sour cherries and medium for the sweet sorts.

Note: Due to the extreme acidity of some sour cherries they do not always keep well in cans. When packing sour sorts be particularly careful in exhausting. Exhaust all sizes 8 minutes. Process No. 1 cans 10 minutes, No. 2 and No. $2\frac{1}{2}$ cans 15 minutes.

GOOSEBERRIES—Use R. Enamelled Cans

Snip off the blossom and stalk. Use heavy syrup, boiling hot. Exhaust all sizes 8 minutes. Process No. 1 cans 5 minutes and No. 2 and No. $2\frac{1}{2}$ cans 15 minutes.

PEACHES—Use Plain Cans

For freestone peaches follow the directions given for apricots. Cling stone peaches may be peeled by hand or by dipping in a boiling lye solution (1 ounce lye per gallon of water) followed by thorough washing in cold water. Halve and pit the peaches then soften by dipping in boiling water for about 3 minutes. Use medium syrup which may be flavoured by boiling with cracked pits, using 1 pit per quart. Exhaust all sizes 6 minutes. Process No. 1 cans 10 minutes, No. 2 cans 20 minutes and No. $2\frac{1}{2}$ cans 25 minutes.

PEARS—Use Plain Cans

Peel, halve and core the pears. If very hard pears are used soften the halves by dipping in boiling water for a few minutes before packing, otherwise pack as soon as prepared. Use light or medium syrup. Exhaust all sizes 6 minutes. Process No. 2 cans 15 minutes and No. $2\frac{1}{2}$ cans 20 minutes.

PLUMS—Use R. Enamelled Cans

Plums should be washed carefully to remove spray residue. They are packed directly into cans and covered with heavy or medium syrup. Exhaust all sizes 8 minutes. Process No. 2 cans 12 minutes and No. $2\frac{1}{2}$ cans 15 minutes.

RHUBARB—Use R. Enamelled Cans

Wash the stalks and cut in 1 inch lengths. Soak the cut pieces in cold water for about 12 hours then, using a muslin bag, dip in boiling water for about 10 seconds. Pack hot and use heavy syrup. Exhaust all sizes 6 minutes. Process No. 1 cans 5 minutes, No. 2 cans 6 minutes and No. $2\frac{1}{2}$ cans 8 minutes.

TOMATOES—Use R. Enamelled Cans

Peel tomatoes by dipping in boiling water for one minute, followed by a cold dip. Slip off skin, core, and trim off green parts. Pack into cans and cover with hot juice, adding $\frac{1}{2}$ teaspoon of salt per No. 2 can. Exhaust all sizes 5 minutes. Process No. 1 cans 20 minutes, No. 2 cans 35 minutes and No. $2\frac{1}{2}$ cans 45 minutes.

TOMATO JUICE

Tomato juice is prepared by heating the tomatoes to the simmering point then brushing through a sieve. Add 1 teaspoon salt per quart of juice, heat to near boiling, fill into cans and seal immediately. No exhaust is necessary. Process the same as for whole tomatoes. The flavour of tomato juice may be improved by the addition of a small amount of lemon juice.

EXHAUST AND PROCESS TIME TABLE FOR FRUITS

Fruit	Kind of Can	Exhaust	Process in Boiling Water			
			No. 1 Cans	No. 2 Cans	No. 2½ Cans	No. 10 Cans
			Min.	Min.	Min.	Min.
Apples.....	Plain.....	4 minutes...		15	18	30
Apple Sauce.....	Plain.....	Seal hot.....	5	15	15	25
Apricots.....	Plain.....	4 minutes...		10	15	20
Berries.....	R. En.....	10 minutes...	10	15	15	30
Cherries.....	R. En.....	8 minutes...	10	15	15	25
Peaches.....	Plain.....	6 minutes...	10	20	25	40
Pears.....	Plain.....	6 minutes...		15	20	30
Plums.....	R. En.....	8 minutes...		12	15	25
Rhubarb.....	R. En.....	6 minutes...	5	6	8	12
Tomatoes.....	R. En.....	5 minutes...	20	35	45	75

CANNING VEGETABLES IN TIN CANS

For canning vegetables the following steps are necessary:—

1. Preparation of the vegetables.
2. Blanching.
3. Packing into cans.
4. Brine filling.
5. Exhausting.
6. Sealing.
7. Processing.
8. Cooling.

1. Preparation of the vegetables includes grading, washing, trimming, peeling, or such steps as are necessary to put the vegetables into fit condition for canning.

2. *Blanching* consists of a boiling water dip followed in most cases by a cold water dip. Its purpose is (1) to soften the vegetables so that they may be more closely packed, (2) to loosen the skins of such vegetables as beets and carrots, and (3) to fix the colour of some green vegetables. The handiest way to blanch is to place the vegetables in a cheesecloth bag, dipping them first in the boiling water for the prescribed time and then in the cold water where they are held long enough to cool sufficiently to handle. Greens, such as spinach, should not be cold dipped but packed as hot as possible, as they pack so densely that subsequent heat penetration is very slow.

3. Vegetables should be packed into the cans immediately after blanching. They should be packed tightly but not forced into the cans.

4. The packed cans are filled up with brine to within $\frac{1}{8}$ inch from the top of the can. The brine must be used boiling hot.

1% brine= $1\frac{1}{2}$ ounces salt per gallon of water

2% brine=3 ounces salt per gallon of water

3% brine=4 ounces salt per gallon of water

1 level teaspoon= $\frac{1}{4}$ ounce.

5. Exhausting of vegetables is the same as for fruits. See canning fruits in tin cans—4.

6. The cans should be sealed immediately following exhausting, taking the cans from the water one by one and sealing each one at once.

7. *Processing* is the term given to the sterilizing or cooking process. To sterilize non-acid vegetables completely requires hours at the temperature of boiling water—the deadly *Botulinus* (Botulism) bacteria can withstand more than 5 hours boiling in some products—whereas at temperatures of 240°F. or 250°F. a comparatively short time is necessary. These temperatures are obtained by processing in steam under pressure, for which a pressure cooker is used (Fig. 3). When using a pressure cooker put in enough hot water to come up to the level of the rack. After putting in the cans seal the cooker and set on the

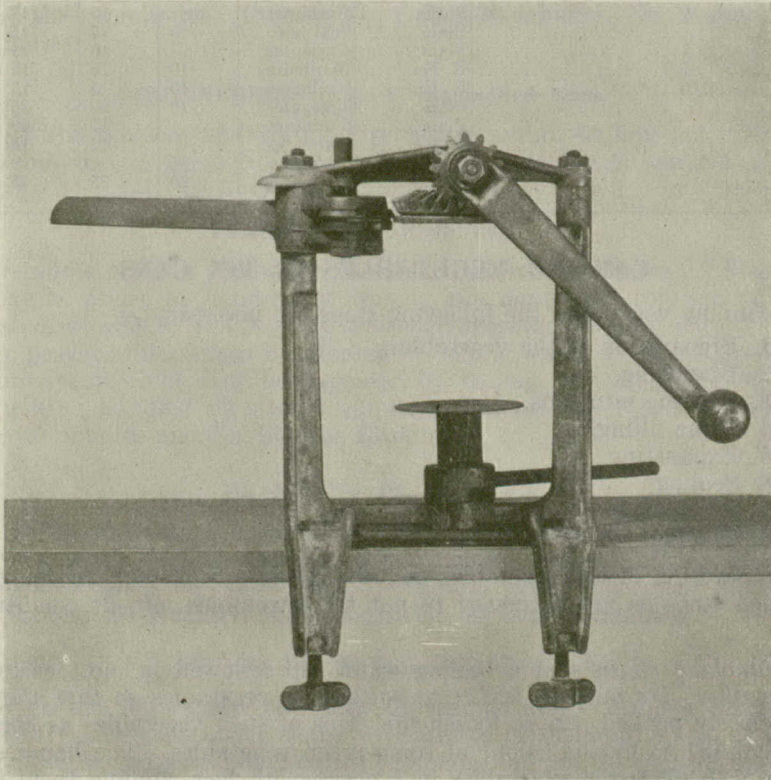


FIGURE 2.—Hand-controlled Can Sealer.

stove. Leave the pet-cock open until a jet of steam has been coming from it for five or six minutes. Then close the pet-cock and watch the gauge. Start measuring the process time from the minute the gauge registers the required pressure. Then move the cooker to the part of the stove that will maintain the pressure, or, in the case of gas or electric stoves, reduce the heat. If an adjustable pop-valve is provided this also may be used to regulate pressure, but, *keep the pressure up throughout the processing period*. When the processing time has elapsed remove the cooker from the stove and do not remove the lid until the pressure has fallen to zero. Do not open the pet-cock to reduce the pressure as it will place an undue strain on the cans. After opening the cooker remove the cans and place in cold water to cool.

8. The cans are cooled in cold water until cool enough to handle. They should then be dried off, labelled, and placed in a dry, cool place.

FOLLOW THESE RULES:

1. Use only strictly fresh vegetables.
2. Make sure the machine is sealing perfectly.
3. Maintain the required pressure in the cooker and process for the times given.

ASPARAGUS—Use Plain Cans

Asparagus for canning should be very fresh. Wash the stalks and cut into lengths to fit No. 2 cans. Blanch in boiling water 2 minutes followed by cold dip. Pack tightly into cans, blossom end up. Use 3 per cent brine, boiling hot. Exhaust 6 minutes and process, at 10 pounds pressure, No. 2 and No. 2½ cans 25 minutes.

GREEN or WAX BEANS—Use Plain Cans

Beans may be packed whole or cut. Blanch 2-5 minutes according to size and maturity, followed by cold dip. Pack tightly into cans and use 2 per cent brine, boiling hot. Exhaust 5 minutes and process, at 10 pounds pressure, No. 2 cans 20 minutes and No. 2½ cans 25 minutes.

LIMA BEANS—Use C. Enamelled Cans

Blanch Lima beans 4-6 minutes. Use 2 per cent brine, boiling hot. Exhaust 5 minutes, and process, at 10 pounds pressure, No. 2 cans 35 minutes and No. 2½ cans 40 minutes.

BEANS WITH PORK—Use Plain Cans

The beans should be soaked overnight and then cooked in water until soft. The tomato, onion and molasses may then be added to taste. Reheat the beans to near boiling and fill into the cans hot, placing a piece of salt pork in each can, and sealing immediately. No exhaust is necessary. Process, at 15 pounds pressure, No. 2 cans for 90 minutes.

BEETS—Use R. Enamelled Cans

Blanch beets in boiling water 10-20 minutes according to size, followed by a cold dip. Slip off the skins and pack into cans. Baby beets may be packed whole but large beets should be diced or sliced. Two per cent brine is used, boiling hot, and sugar may be added to taste. Exhaust 5 minutes. Process, at 10 pounds pressure, No. 2 cans 25 minutes, No. 2½ cans 30 minutes.

CARROTS—Use Plain Cans

Small carrots are preferable and are packed whole. Large carrots must be quartered or diced, and should be scraped well before cutting. Following packing the cans are filled with 2 per cent brine, boiling hot. Exhaust 4 minutes. Process, at 10 pounds pressure, No. 2 cans 35 minutes, No. 2½ cans 40 minutes.

CORN—Use C. Enamelled Cans

Cream style corn is the most popular for home use. Cut the kernels from the cob using a shallow cut. Then scrape the pulp from the part of the kernels remaining on the cob. Mix the pulp with water (1 part water to 3 parts pulp) and add sugar and salt to taste. Mix the kernels and cream and boil for two

minutes. Then fill into cans hot, leaving $\frac{1}{8}$ inch headspace. Seal immediately and process at 15 pounds pressure, No. 1 cans 65 minutes, No. 2 cans 75 minutes. Do not use larger than No. 2 cans and cool very thoroughly after processing. This cooling is important as corn is subject to "Flat Souring".

To can whole grain corn, cut the kernels from the cob as deeply as possible. Wash well, and fill into cans using 2 per cent brine, boiling hot. Exhaust 5 minutes. Process, at 15 pounds pressure, No. 1 cans 30 minutes, and No. 2 cans 30 minutes.

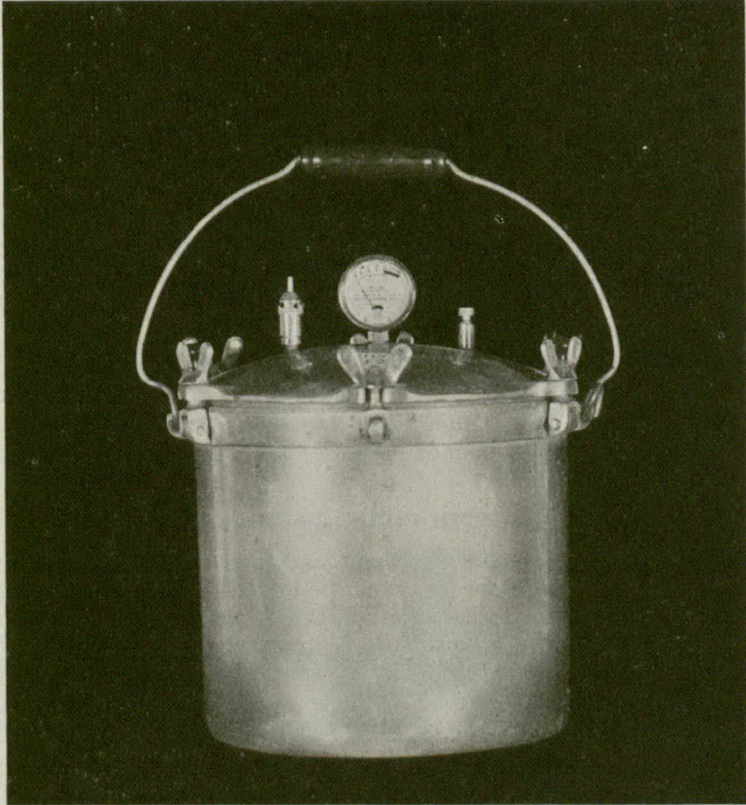


FIGURE 3.—Pressure Sterilizer.

MUSHROOMS—Use Plain Cans

Use only fresh mushrooms. Wash, peel and trim, holding the trimmed mushrooms in cold water to which a little vinegar has been added (1 tablespoon per quart). Blanch in boiling water, to which a little salt has been added, 3-6 minutes, followed by a cold dip. Pack into cans and cover with 2 per cent brine, used boiling hot. Exhaust 12 minutes and process, at 10 pounds pressure, No. 1 cans 25 minutes, No. 2 cans 25 minutes.

PEAS—Use C. Enamelled Cans

Immediately after shelling the peas should be blanched 2-4 minutes in boiling water followed by a cold dip. Pack into cans and cover with 2 per cent brine, boiling hot, to which a little sugar may be added if desired. No exhaust is necessary for peas if the brine is added boiling hot and the cans sealed

immediately. Process, at 10 pounds pressure, No. 1 cans 30 minutes, No. 2 cans 40 minutes, and No. 2½ cans 50 minutes.

PUMPKIN—Use R. Enamelled Cans

Steam or simmer pumpkin pieces and make into pulp by passing through a sieve. Heat the pulp to boiling and fill into cans as hot as possible, sealing immediately. No exhaust is necessary. Process, at 10 pounds pressure, No. 1 cans 60 minutes, No. 2 cans 60 minutes, and No. 2½ cans 75 minutes.

SPINACH—Use Plain or C. Enamelled Cans

The spinach must be thoroughly washed to remove sand and grit. Blanch in boiling water for 4 minutes. Do not dip in cold water, but pack into cans hot, adding 2 per cent brine, also boiling hot. Exhaust 5 minutes. Process, at 10 pounds pressure, No. 1 cans 40 minutes, No. 2 cans 60 minutes, and No. 2½ cans 70 minutes.

EXHAUST AND PROCESS TIME TABLE FOR VEGETABLES

Vegetable	Kind of Can	Exhaust	Process at 10 lbs. 240° F.			Process at 15 lbs. 250° F.		
			No. 1 Cans *	No. 2 Cans *	No. 2½ Cans *	No. 1 Cans *	No. 2 Cans *	No. 2½ Cans *
Asparagus.....	Plain.....	6 minutes.....		25	25		13	15
Green Beans.....	Plain.....	5 minutes.....		20	25		15	20
Lima Beans.....	C. En.....	5 minutes.....		35	40		30	35
Pork and Beans.....	Plain.....	Fill hot.....					90	
Beets.....	R. En.....	5 minutes.....		25	30		20	25
Carrots.....	Plain.....	4 minutes.....		35	40		20	25
Cream Corn.....	C. En.....	Fill hot.....				65	75	
Corn (Grain).....	C. En.....	5 minutes.....				30	30	
Mushrooms.....	Plain.....	12 minutes.....	25	25		20	20	
Peas.....	C. En.....	Not necessary..	30	40	50	18	20	25
Pumpkin.....	R. En.....	Fill hot.....	60	60	75	45	50	60
Spinach.....	C. En.....	5 minutes.....	40	60	70	40	50	60

* Minutes.

SALE OF CANNED GOODS

Attention is drawn to the following requirements under the Meat and Canned Foods Act.

"Canned Foods" includes foods except fish and shell fish that have been preheated, cooked, preserved, condensed, evaporated, dehydrated, dried or otherwise processed or prepared for food, and are placed in any closed can, bottle, package or container.

28. (3) All canned fruits or vegetables or products thereof, or any food or food products except fish and shell fish which may be named by the Governor in Council, shall be offered for sale only in such cans or other containers as the Governor in Council may by regulations prescribe, and such cans or containers must contain the quality, quantity, or weight prescribed by the regulations.

